

# Generic Status and Lectotypifications for *Gymnospora* (Polygalaceae)

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**ABSTRACT.** *Polygala* sect. *Gymnospora* Chodat (Polygalaceae) is recognized at the generic rank based on recent phylogenetic evidence as *Gymnospora* (Chodat) J. F. B. Pastore with two new combinations, *G. blanchetii* (Chodat) J. F. B. Pastore and *G. violoides* (A. St.-Hil. & Moq.) J. F. B. Pastore. We also present a taxonomic key for species identification and argue that *P. blanchetii* Chodat should not be treated as a synonym of *P. pedicellaris* A. St.-Hil. & Moq. and that *P. pedicellaris* is better treated as a synonym of *P. violoides* A. St.-Hil. & Moq. (as *G. violoides*). Thus, the name *P. blanchetii* (as *G. blanchetii*) is established, in keeping with its traditional treatment. Lectotypifications are provided for the following five names: *P. blanchetii*, *P. laxa* Nees & Mart., *P. maritima* Vell., *P. pedicellaris*, and *P. violoides*.

**RESUMO.** *Polygala* seção *Gymnospora* Chodat (Polygalaceae) é reconhecida com status genérico, como *Gymnospora* (Chodat) J. F. B. Pastore, baseado nas evidências filogenéticas. Nós apresentamos duas novas combinações *G. blanchetii* (Chodat) J. F. B. Pastore e *G. violoides* (A. St.-Hil. & Moq.) J. F. B. Pastore, uma chave taxonômica para identificação das duas espécies e defendemos que *P. blanchetii* Chodat não deveria ser tratada como um sinônimo de *P. pedicellaris* A. St.-Hil. & Moq., enquanto que *P. pedicellaris* é melhor tratada como sinônimo de *P. violoides* A. St.-Hil. & Moq. (como *G. violoides*). Assim, o nome *P. blanchetii* (como *G. blanchetii*) é estabelecido, mantendo o seu tratamento mais tradicional. São também indicados lectótipos para os seguintes nomes: *P. blanchetii*, *P. laxa* Nees & Mart., *P. maritima* Vell., *P. pedicellaris* e *P. violoides*.

**Key words:** Brazil, *Gymnospora*, *Polygala*, Polygalaceae.

*Gymnospora* (Chodat) J. F. B. Pastore, here treated as a genus, was traditionally considered by Chodat (1893) and Paiva (1998), respectively, as a section or subgenus of *Polygala* L. (Polygalaceae). Currently, *Gymnospora* is comprised of two species that were included in *Polygala*, *G. violoides* (A. St.-Hil. &

Moq.) J. F. B. Pastore and *G. blanchetii* (Chodat) J. F. B. Pastore. A third species originally included in *Polygala* sect. *Gymnospora* by Chodat, *P. membranacea* (Miq.) Görtz, is taxonomically excluded from *Gymnospora* because it lacks the diagnostic morphological features. *Gymnospora* is endemic to Brazil, apparently restricted to forest margins and savannas. It is characterized by the following set of characters: pubescent pedicels, pubescent and free external sepals, calyx persistent in frutification, noncristate carina, puberulent and chartaceous capsules, and minute seed appendages or caruncles (Chodat, 1893; Marques, 1984). The caruncle, which is well developed in most other genera related to *Polygala*, can have a strong role in seed dispersal (Forest et al., 2007). The reduction of the caruncle and the flattened and membranous fruits suggest that *Gymnospora* is characterized by wind dispersal rather than by ants.

The generic status for *Gymnospora* is additionally supported by phylogenetic evidence (Forest et al., 2007). *Gymnospora*, represented by *G. violoides*, lies as sister to the *Badiera* DC.–*Hebecarpa* (Chodat) J. R. Abbott–*Phlebotaenia* Griseb. clade. All traditional sections or subgenera of *Polygala* are more closely related to other genera than they are to *Polygala*, e.g., *Acanthocladus* Klotzsch ex Hassk. and *Bredemeyera* Willd. Thus, using the criterion of monophyly, *Gymnospora* cannot be maintained within the genus *Polygala*. Analysis of sequence data from *G. blanchetii* has been challenging, because the extant material of the species deposited in the herbaria studied has been thus far inadequate for molecular studies (Pastore, pers. obs.). However, morphological characters shared by both species of the genus unmistakably support the similarity between species of *Gymnospora*.

After an analysis of the type collections of all relevant names, we conclude that there are two distinct species: *Polygala blanchetii* and *P. violoides*, with *P. pedicellaris* treated as a synonym of the latter. This is in agreement with the conclusions reached by Marques (1984).

**I. Gymnospora** (Chodat) J. F. B. Pastore, stat. nov.  
*Polygala* sect. *Gymnospora* Chodat, Arch. Sci. Phys. Nat. 25: 698. 1891. *Polygala* subg. *Gymnospora* (Chodat) Paiva, Fontqueria 50(4): 147. 1998. TYPE: *Polygala violoides* A. St.-Hil. & Moq.

IDENTIFICATION KEY FOR *GYMNOSPORA* SPECIES FROM SOUTHEASTERN BRAZIL

1a. Flowers 6–8 mm; bract lanceolate, 1.8–2.2 mm long; pedicel 2–6 mm long; ovary long stipitate .....  
..... *G. blanchetii*  
1b. Flowers 9–10 mm; bract deltate, 0.5–0.7 mm long; pedicel 6–8 mm long; ovary short stipitate .....  
..... *G. violoides*

**1. Gymnospora blanchetii** (Chodat) J. F. B. Pastore, comb. nov. Basionym: *Polygala blanchetii* Chodat, Mém. Soc. Phys. Genève 31(2): 88. 1893. TYPE: Brazil. Bahia: Ilhéus, 1836 (fl.), J. S. Blanchet 2385 (lectotype, designated here, P [barcode] 00733386; isolectotype, G [barcode] 00359485, G [barcode] 00359486).

*Polygala laxa* Nees & Mart. in Wied-Neuwied, Nova Acta Phys.-Med. Acad. Caes. Leop.-Carol. Nat. Cur. 12: 24. 1824, nom. illeg., non *Polygala laxa* Thunb., Prodri. Pl. Cap. 2: 121. 1800. TYPE: Brazil. Bahia: “ad flumen Ilhéos circa viam, quae est in Minas generales, in silvis primaevis,” Dec. 1816 (fl.), M. A. P. Wied-Neuwied s.n. (lectotype, designated here, FR-s.n.; isolectotype, BR-8526069, BR-8526991).

*Polygala blanchetii* has been reported principally from southeastern Bahia near Ilhéus, although the taxon was collected twice from other Brazilian states (Minas Gerais and Rio de Janeiro). The species is only known from 19th century collections, and an extensive search in several regional herbaria (i.e., CEPEC, HB, HUEFS, and NY) did not uncover any more recent material. Thus, it is assumed that this species is likely extinct (Pastore, 2009). The lectotype for *Gymnospora blanchetii* was chosen from the obvious link between the original collector and species epithet, based on the citation of the herbarium on the original description, and it is also supported by Chodat’s original handwriting on the sheet label. *Polygala laxa* Nees & Mart. is an illegitimate name, being a later homonym of *P. laxa* Thunb. In spite of the fact that this was the first species described in the *Gymnospora* group in 1824, no subsequent references could be found in the literature. Although the located specimens of *P. laxa* Nees & Mart. were not annotated by Nees, the specimen at FR is the only one that has been annotated with “*Polygala laxa* N. et Mart. / Dec. 1816. Prinz Max v. Neuwied leg. / Am der Minas

Strasse im Urwalde,” which agrees perfectly with the protologue and the information on the original label by Wied at BR [barcode] 8526069.

*Additional specimens examined.* BRAZIL. s. loc., 1815–1817 (fl.), F. Sellow 1016 (BM); s. loc., s.d. (fl.), F. Sellow s.n. (CGE, K). **Bahia:** Ilhéus, F. Sellow 66 (BR, K); Ilhéus, “Prof. Ambulante” [sic] 03 (R); ad Almada, “Collector lignorum” 03 (M [2]); in sylvis ad Almada, C. F. P. Martius s.n. (M). **Espírito Santo:** Rio Doce, s.d., *Anonymous* s.n. [“communic. Martius 1827,” probably collected by M. A. P. Wied-Neuwied s.n. on Dec. 1815 or F. Sellow s.n. on April 1816, Moraes, pers. comm.] (BM). **Rio de Janeiro:** s. loc., 1814–1815, Sellow L 366 B 531 (M).

**2. Gymnospora violoides** (A. St.-Hil. & Moq.) J. F. B. Pastore, comb. nov. Basionym: *Polygala violoides* A. St.-Hil. & Moq., Ann. Soc. Sci. Orléans 9: 55. 1828. TYPE: Brazil. Minas Gerais: “Nascitur in sylvis primaevis prope praedium Canna braba in parte orientali provinciae Minas Geraës. Florebat Aprili,” s.d. (fl.), A. Saint Hilaire 1003 Cat. B1 (lectotype, designated here, P [barcode] 00733579; isolectotypes, MPU [barcode] 012178, P [barcode] 00733580).

*Polygala pedicellaris* A. St.-Hil. & Moq., Mém. Mus. Hist. Nat. 17: 322. 1828. *Polygala violoides* A. St.-Hil. & Moq. var. *pedicellaris* (A. St.-Hil. & Moq.) Chodat, Mém. Soc. Phys. Genève 31, pt. 2, no. 2: 88. 1893. TYPE: Brazil. Minas Gerais: “Nascitur ad basim montis Serra da Lapa in provinciæ Minas Geraës. Florebat Februario,” s.d. (fl.), A. Saint Hilaire cat. B2 2177 (lectotype, designated here, P [barcode] 00733585; isolectotypes, MPU [barcode] 012177, P [barcode] 00733581, P [barcode] 00733578).

*Polygala maritima* Vell., Fl. Flumin.: 293. 1829. syn. nov. TYPE: Brazil. Fl. Flumin. Icon. 7: tab. 68. 1831. (lectotype, designated here, in Vellozo [1831: tab. 68]).

*Polygala pachyrrhiza* Casar., Nov. Stirp. Bras. Dec.: 20. 1842. TYPE: Brazil. Rio de Janeiro: “Habitat in collibus siccis circa Jurijuba et Piratininga, prope Rio de Janeiro,” s.d., G. Casaretto 1918 (holotype, GE not seen; isotype, G).

The lectotypes of *Gymnospora violoides* and *G. pedicellaris* were chosen from the distinctive label on the respective sheets, which have been associated with the original description and illustrations provided by Saint-Hilaire (1829) (see also the comments on Pastore et al., 2010). With respect to *Polygala maritima*, there are few references to Vellozo’s species available in the literature. Even Marques (1979), who prepared a more recent treatment of Polygalaceae for *Flora of Rio de Janeiro*, overlooked Vellozo’s names. Indeed, several reasons could be attributed for this omission. Many of Vellozo’s collections have not been located (Carauta, 1973)

and may no longer be extant. His descriptions and plates (Vellozo, 1829, 1831, respectively) are often insufficient for diagnostic identification to the species level. However, *P. maritima* is one of Vellozo's species that can be unequivocally interpreted, mainly from its illustration, which presents some diagnostic characteristics such as the keel not being crested, the roots having tubercles, and all of the sepals being free. Vellozo's plate is here designated as the lectotype of *P. maritima*. Bennett (1874) misinterpreted *P. pedicellaris* and incorrectly applied the name to a specimen of what would later be described as *P. blanchetii* by Chodat (1893), even though Chodat treated *P. pedicellaris* as a variety of *P. violoides*. Bernardi (2000) evidently did not check the types either in Paris or Montpellier and followed Bennett's (1874) interpretation, treating *P. pedicellaris* as the correct name for *P. blanchetii*.

*Additional specimens examined.* BRAZIL. s. loc., s.d. (fl.), *F. Sellow s.n.* (BM). **Espírito Santo:** Rod. BR 101, 20 km S de Linhares, 16 Oct. 1983, *G. Hatschbach & O. Guimarães* 46915 (C, CEPEC, INPA, MBM, MO, NY, RB). **Goiás:** Urucuá, Faz. Amarra-Cachorro, 500 m abaixo da ponte sobre o Macaco, 6 Oct. 1992, *B. M. T. Walter et al.* 2015 (CEN); Jataí, Faz. Matalta ca. 2 km da estrada Jataí-Caiapônia, 2 Oct. 1968, *S. F. Fônseca & E. Onishi* 1010 (UB). **Mato Grosso do Sul:** Bonito, Projeto Guaicurus, ca. 4–5 km N of Bonito, 9 Nov. 2002, *G. Hatschbach et al.* 74978 (HUEFS, MBM, RB, SPSF, UB). **Minas Gerais:** Guarani, UHE, de Ponte I, Palestina II, 11 Oct. 1997, *A. Salino* 3549 (BHCB); Lagoa Santa, prope Rio das Velhas, *J. E. B. Warming* 425 (C); Viçosa, Faz. Sobrada, rd. to Cajury, 12 Nov. 1930, *Y. E. J. Mexia* 5287 (NY). **Rio de Janeiro:** near Rio Comprido, Aug. 1836, *G. Gardner* 174 (BM, CGE, K); Rio de Janeiro, *C. Gaudichaud-Beaupré* 696 (BM, G, K, P). **São Paulo:** São Paulo, *G. Perdonnet* 14 (S).

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